Claims:

1. (Canceled)

2. (Canceled)

3. (Canceled)

4. (Currently Amended) A transmission position encoder for a vehicle having a transmission, a transmission controller and a transmission shifter adapted to shift the transmission and reposition the transmission position encoder, the transmission position encoder comprising:

a means for providing a plurality of signals to the transmission controller corresponding to positions of the transmission position encoder, ~~The transmission position encoder as in claim 3~~, wherein said means comprises a bit pattern corresponding to four detectors and a unique binary code is provided for each gear of the transmission and a transition position ~~before and after each gear position~~ between adjacent gear positions, the transmission position encoder being manipulated into discrete positions by the transmission shifter wherein the transmission controller is adapted to determine if there is a failure in said means as the transmission position encoder transitions from a single position to one other position.

5. (Currently Amended) A transmission position encoder for a vehicle having a transmission, a transmission controller and a transmission shifter adapted to shift the transmission and reposition the transmission position encoder, the transmission position encoder comprising:

a means for providing a plurality of signals to the transmission controller corresponding to positions of the transmission position encoder, wherein said means comprises a bit pattern corresponding to three detectors each having a unique bit pattern corresponding to the positions of the transmission position encoder, ~~The transmission position encoder as in claim 2,~~wherein each state of said bit pattern changes when the transmission is shifted from park to

reverse, the transmission position encoder being manipulated into discrete positions by the transmission shifter wherein the transmission controller is adapted to determine if there is a failure in said means as the transmission position encoder transitions from a single position to one other position.

6. (Currently Amended) A transmission position encoder for a vehicle having a transmission, a transmission controller and a transmission shifter adapted to shift the transmission and reposition the transmission position encoder, the transmission position encoder comprising:

a means for providing a plurality of signals to the transmission controller corresponding to positions of the transmission position encoder, wherein said means comprises a bit pattern corresponding to three detectors each having a unique bit pattern corresponding to the positions of the transmission position encoder, ~~The transmission position encoder as in claim 2,~~ wherein each state of said bit pattern changes when the transmission is shifted from neutral to drive, the transmission position encoder being manipulated into discrete positions by the transmission shifter wherein the transmission controller is adapted to determine if there is a failure in said means as the transmission position encoder transitions from a single position to one other position.

7. (Original) The transmission position encoder as in claim 5, wherein said bit pattern is in a mixed state corresponding to the transmission being in park.

8. (Original) The transmission position encoder as in claim 5, wherein the bit pattern of at least two of the three detectors changes with any shifting of the transmission.

9. (Original) The transmission position encoder as in claim 8, wherein the transmission controller is adapted to track the changes in bit pattern.

10. (Original) A bit map for a transmission position encoder having a plurality of sensors for a vehicle having a transmission, a transmission controller and a transmission shifter

adapted to shift the transmission from any one of the following states of the transmission: park, reverse, neutral, drive, and any one of a plurality of gear positions comprising drive, the transmission shifter is also adapted to reposition the transmission position encoder, the bit map comprising:

a plurality of states corresponding to the position of the plurality of sensors of the transmission position encoder, wherein each of the plurality of states changes as the transmission is shifted from park to reverse and wherein at least two of said plurality of states are changed in any other shifting sequence of the transmission;

wherein said plurality of states are provided as signals to the transmission controller.

11. (Original) The bit map as in claim 10, wherein the plurality of states corresponding to the park position of the transmission are mixed.

12. (Original) The bit map as in claim 10, wherein the plurality of states are binary code comprising either a high output or a low output.

13. (Original) The bit map as in claim 10, wherein the plurality of sensors are hall sensors.

14. (Original) The bit map as in claim 10, wherein the transmission position encoder is adapted to sense either linear or angular movement.

15. (Original) The bit map as in claim 14, wherein the linear or angular movement of the transmission position encoder corresponds to shifting of the transmission.

16. (Original) The bit map as in claim 10, wherein the transmission controller is adapted to track and compare the changes in the bit pattern to a look up table in the memory of the transmission controller.

17. (Currently Amended) A transmission position encoder for a vehicle having a transmission, a transmission controller and a transmission shifter adapted to shift the transmission and reposition the transmission position encoder, the transmission position encoder comprising:

~~a plurality of~~ three detectors for providing a plurality of signals to the controller, said plurality of signals corresponding to discrete positions of the transmission position encoder wherein the controller is adapted to determine if there is a failure in any one of the detectors as the transmission position encoder transitions from a single position to one other position, wherein each of said plurality of signals changes when the transmission is shifted from park to reverse and the plurality of signals are in a mixed state when the vehicle is started in park.

18. (Cancelled)

19. (Cancelled)

20. (Currently Amended) The transmission position encoder as in ~~claim 18~~ claim 17, wherein each of said plurality of signals changes when the transmission is shifted from neutral to drive.

21. (Currently Amended) The transmission position encoder as in ~~claim 18~~ claim 17, wherein each of said plurality of signals is powered up in a mixed state corresponding to the transmission being in park.

22. (Currently Amended) The transmission position encoder as in ~~claim 19~~ claim 17, wherein at least two of said plurality of signals changes with any shifting of the transmission.

23. (Currently Amended) The transmission position encoder as in claim 22, wherein the transmission controller is adapted to track the changes in the plurality of signals.

24. (Currently Amended) ~~The transmission position encoder as in claim 17,~~A transmission position encoder for a vehicle having a transmission, a transmission controller and a transmission shifter adapted to shift the transmission and reposition the transmission position encoder, the transmission position encoder comprising:

a plurality of detectors for providing a plurality of signals to the controller, said plurality of signals corresponding to discrete positions of the transmission position encoder wherein the controller is adapted to determine if there is a failure in any one of the detectors as the transmission position encoder transitions from a single position to one other position, wherein said plurality of detectors is four detectors and a unique binary code is provided for each gear of the transmission and a transition position before and after each gear position.

25. (Currently Amended) The transmission position encoder as in claim 24, wherein each of said plurality of signals changes when the transmission is shifted from park through the transition to reverse and each of said plurality of signals is powered up in a mixed state corresponding to the transmission being in park.

26. (Original) The transmission position encoder as in claim 25, wherein the transmission controller is adapted to track the changes in plurality of signals.

27. (Canceled)